Albrecht GP 1

SERVICE MANUAL

GPS + PMR
PORTABLE
HANDHELD
RADIO

24. 04. 2002

ALAN Electronics GmbH

CONTENT

7. CHANNEL DATA

1. GPS(Global Positioning System)

1.1 PRODUCTOR : JRC

1.2 MODEL No : ALBRECHT GP 1

1.3 GPS ENGINE SPEC (ATTACH FILE)

2. PMR(Private Mobile Radio)

1. GENERAL

1.1 GENERAL

This equipment, ALBRECHT GP 1 is called 2 way portable handheld radios. The frequency range is 446.00625~446.09375MHz UHF operating Channels for international 2 way portable radios.

1.2 CHARACTERISTIC

a) All active device in this radio is composed of semiconductor and high density IC.
b) To design this radio in compact and weight approximately 273g including battery.
C) CPU of this equipment is TMP91CY22F from TOSHIBA.
d) It's power can operate by use of Alcaline 4 cell(1.5V AA) battery.

1.3 COMPOSITION

This radio is composed of following.

a) Transmitter(W/Antenna)
b) Belt clip

2. SPECIFICATION

2.1 GENERAL SPECIFICATIONS

a) Frequency Range : 446.00625 ~ 446.09375MHz
b) Output Impedance : 50 Ohms unbalanced
c) Modulation Type : 8K0F3E
d) Communication Mode : Half duplex
e) Channel Capacity : 8 Channel
f) Channel Spacing : 12.5 KHz
g) Power : 6.0V(alkaline)
h) Battery Life
GPS ON : ALCA 2000mAh > 9hours(Tx 5%, Rx 5%, Stand-by 90%)
GPS OFF: ALCA 2000mAh > 16hours(Tx 5%, Rx 5%, Stand-by 90%)
i) Operating Temperature : -20 ~ +55 °C
j) Dimension : 221.7(H)x 62.8(W)x 40.3(D)mm
k) Weight : 280g(with Battery)

2.2 ELECTRICAL SPECIFICATION

a) TRANSMITTER

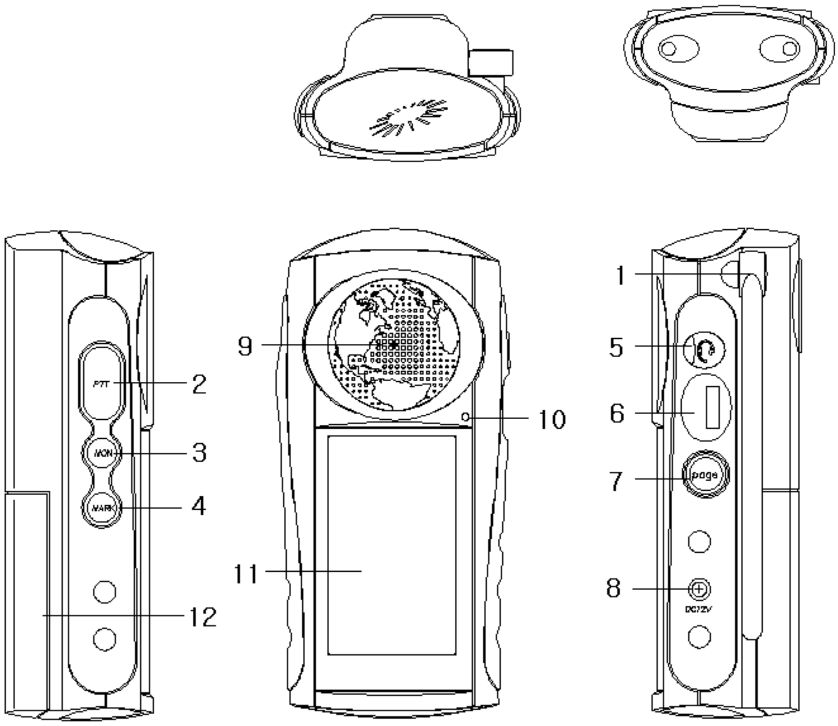
1) Output Power : Max. 500mW
2) Frequency Stability : +/- 3ppm (0°C~ +30°C)
+/- 5ppm (-20°C~+55°C)
3) Modulation Method : FM
4) Oscillation Method : PLL SYNTHESIZER
5) Max. Frequency Deviation : < +/- 2.5KHz (with Tone)
6) Cooling Method : air-cooling Method
7) Spurious Emission : < -36dBm/-30dBm
8) FM Hum/Noise : > -40dB(1kHz 60% Modulation, W/CCITT)
9) Distortion : < 5% (1kHz 60% modulation)
10) Tx Audio Response : 6dB /OCT +/-3dB PRE-EMPHASIS (300Hz~2.5kHz)

b) RECEIVER

1) Receive Method : Double Super Heterodyne
2) Receive Sensitivity : < 0.28uV(20dB SINAD W/CCITT)
3) Squelch Sensitivity : 6~8dB(20dB SINAD)
4) Bandwidth : > 3kHz(6dB ATT point)
5) Selectivity : < -60dB(12.5kHz)
6) Local Frequency Stability : +/-5ppm(-20°C ~ 60°C)
7) Spurious Response : > 40dB
8) Audio output : 200mW(Internal 8Ohms load THD 10%) EXT 60mW
9) Distortion : < 5% (1kHz 60% Modulation)
10) RX Audio Response : 6dB/OCT +/-3dB DE-EMPHASIS(300Hz~2.5kHz)
11) S/N Ratio : < 40dB(1kHz 60% Modulation W/CCITT)
12) IF : 1'st IF = 21.7MHz
2'nd IF = 450kHz
13) Local Frequency : 1'st Local Frequency = fc – 21.7MHz
2'nd Local Frequency = 21.25MHz

3. OPERATION

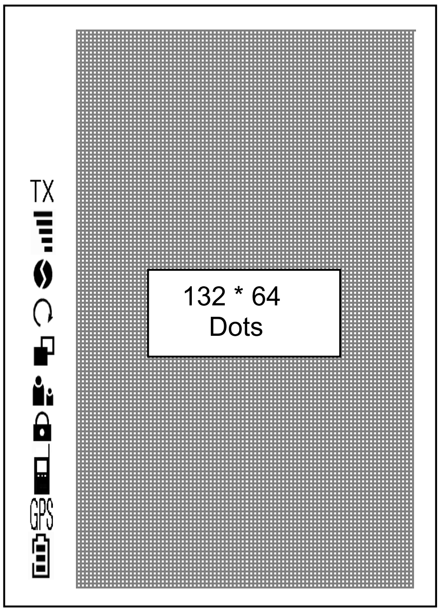
3.1 Key Name



FUNCTIONS AND CONTROLS

1) Antenna
2) Push-To-Talk (PTT) Button
3) Monitor Button
4) Mark & Power Button
5) External MIC / Speaker
6) Up/Down/Enter Button & Volume Control
7) Page Button
8) Charging Jack
9) Built-in Speaker
10) Built-in Microphone
11) LCD Panel
12) Battery Door Button

3.2 ICONS on LCD



132 * 64 dots with ICONS

1) TX Indicator

TX Appears when a signal is being transmitted.

2) RSSI (Receiving Signal Strength Indicator)

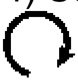
 Indicates the receiving signal strength

3) CTCSS Indicator



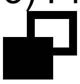
Blinks when the correct CTCSS tone is entered.

4) Seek Scan Indicator



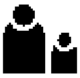
Appears in the seek scan mode or when the seek scan mode is activated.

5) Priority Scan Indicator

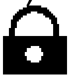


Appears in the priority scan mode or when the priority scan mode is activated.

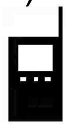
6) VOX Indicator

 Blinks in VOX selection mode or appears when VOX is activated.

7) Key Lock Indicator

 Blinks in auto lock selection mode or when the key lock is activated.

8) GMRS Indicator

 Appears GMRS is activated.

9) GPS Indicator

GPS Appears GPS is activated.

10) Battery Level Indicator

 Battery Level Meter indicates the remaining battery strength.

3.3 Key Function

3.3-1 Power On/Off & Mark Button(#4)

1) Short Touch

a) Under Power off
Press this button (#4) briefly to turn the unit on.
A short Confirming melody will play.

b) Under Power on
Press this button (#4) briefly to go Mark Page.

2) Long Touch

a) Pressing this button (#4) for more than 1.5 seconds to turn the unit off.

3.3-2 Up/Confirm/Down Button (#6)

1) Up Button

a) Short Touch

- In the Standby page, press this button briefly to move to the next higher main volume level.
- In the Map page, press this button briefly to view a larger area.
- In the Pointer page, press this button briefly to cycle through other trip computer information such as average speed, maximum speed, moving direction (heading), bearing, location, elevation, time of sunrise/sunset, trip timer and trip odometer.
- In the GPS menu page & Setup page, press this button briefly to shift the current item in each menu to the next item in the same menu.

b) Long Touch

Pressing this button for more than 1.5 seconds will allow you to navigate at a more rapid rate through different items in the each page.

2) Down Button

a) Short Touch

- In the Standby page, press this button briefly to move to the next lower main volume level.
- In the Map page, press this button briefly to view a smaller area.
- In the Pointer page, press this button briefly to cycle through other trip computer information such as average speed, maximum speed, moving direction (heading), bearing, location, elevation, time of sunrise/sunset, trip timer and trip odometer.
- In the GPS menu page & Setup page, press this button briefly to shift the current item in each menu to the previous item in the same menu.

b) Long Touch

Pressing this button for more than 1.5 seconds will allow you to navigate at a more rapid rate through different items in the each page

3) Confirm Button

- In the Standby page, Map Page, & Pointer page, press this button briefly to move to the option selection mode.
- In the GPS menu page & Setup page, press this button briefly to confirm

the required option for respective functions or to go enter the sub-menu.

3.3-3 Page Button(#7)

1) Short Touch

In the Standby Page, Map Page, Pointer Page, GPS Menu Page & Setup Page, Press this button briefly to move to the next Page. In the Sub-menu for GPS Menu Page & Setup Page, Press this button briefly to shift from current sub-menu to the higher sub-menus or pages in the each sub-menus.

2) Long Touch

- Pressing this button for more than 1.5 seconds will allow you to navigate at a more rapid rate through different pages.

3.3-4. PUSH-TO-TALK (PTT) BUTTON (#2)

Press it firmly and speak into the Built-in Microphone (#10) to transmit.
Release it to revert to receive mode.

2 Way Call Ringer:
Press the PTT button twice quickly to call another party on the same channel and the user selected call ringer melody will play.

3.3-5 MONITOR BUTTON (#3)

- Press it to check activity on the current channel before you try to transmit.
- Adjust the Volume Control if necessary.
- If you press and hold the Monitor button (#3) for more than 3 seconds.
- To stop the monitoring press the Monitor Button (#2) and return to the standby mode.

3.3-6 EXTERNAL MIC/SPEAKER (#5)

- This jack accepts an optional headset/microphone for totally handsfree operation.
- Please refer to the enclosed Accessory Order Form to order accessories.
- See also section regarding VOX SELECTION MODE.

3.4 Setting and Operation

3.4-1 Common function setting

1) Mode setting
You can activate the GPS only / PMR only / PMR+GPS / mode.
Default mode : PMR+GPS

2) GPS Information
Coordinates, Time & Date, Odometer, TTG(Time To Go), Speed, moving direction(Heading), Sunrise/Sunset, Elevation.
When you press Up/Confirm/Down Button (#6), GPS position, GPS signal length, GPS status appears in the LCD panel(#11)

3.4-2 GPS function

1) Map Page
This feature provides where you are (the animated figure) and provides a real picture of where you are going. As you travel and leaves a trail (track log).
Waypoint names and symbols are also shown on the map.

2) Pointer Page
This feature helps guide you to a destination.
When you are moving with no particular destination in mind, the Pointer Page shows you your moving direction and speed.
When you're moving towards a specific destination, the Pointer page shows you the name of the location, the distance, and time to go.

3) Mark Page
This feature provides you to inform or transmit your current position to the another party

3.4-3 PMR function setting

1) Basic channel selection
In order to communicate with other PMR units, both you and the receiving party must be on the same channel.
ALBRECHT GP 1 has 8 channels for PMR as indicated by the large digits in the LCD Display Panel(#11).
Before, trying to transmit on the selected channel, you should press the Monitor Button to check the activity on that channel.
If someone is already on the selected channel, you should try another channel that is clear.

To change the basic channel,

- In the Standby page, press the Up/Confirm/Down Button (#6) briefly to enter to the Basic mode.
- When channel is highlighted, press the Up/Confirm/Down Button(#6) briefly to move to the channel selection mode
- In the channel selection mode, Press the Up/Confirm/Down Button (#6) briefly to choose an another main channel number.

2) CTCSS (Coded Tone Controlled Squelch System) sub-channel selection mode

This feature allows you to utilize a less used channel range (00-38) within a main channel. This enables you to communicate with another party on the same main channel using the same sub-code. This helps to avoid congestion on the main channel and filters out unwanted noise and static.

There are 38 CTCSS sub-channels for each main channel.

To change the CTCSS sub-channel,

- When Code is highlighted, press the Up/Confirm/Down button (#6) briefly to move to the Sub-channel selection mode.
- In the Standby page, press the button Up/Confirm/Down (#6) briefly to enter to the Basic mode.
- The corresponding sub-code will be displayed in the LCD panel (#11).
- Press the Up/Confirm/Down button (#6) to confirm your selection.

3) Seek scan mode

This feature allows you to scan for an active channel and communicate with the party transmitting.

To access the Seek Scan menu,

In the Standby page, press the button Up/Confirm/Down (#6) briefly to enter to the Basic mode.

Press the Up/Confirm/Down button (#6) to confirm your selection.

4) Priority Scan mode

This feature allows you to monitor two different channels at the same time. If you pre-set any priority channel other than the current channel in use, the pre-set channel will be scanned every 0.5 second and signals you when a call is received.

To access the Priority Scan mode,

When priority scan is highlighted, press the Up/Confirm/Down button (#6) briefly to enter to the Basic mode.

To change the Priority channel,

In the Priority Scan channel selection mode, press the Up/Confirm/Down button (#6) briefly to choose the desired Priority Scan channel to use.

The corresponding Priority Scan channel will be displayed in the LCD panel (#11).

Press the Up/Confirm/Down button (#6) to confirm your selection.

5) VOX selection mode

The Voice Activated Transmission (VOX) function allows your voice to activate transmission automatically when the Communicator is used with the optional handsfree MIC/headset (refer to enclosed Accessory Order Form).

It also allows handsfree use when a MIC/headset is not being used without having to use the PTT Button (#2).

To access the VOX Selection menu,

- When VOX is highlighted, press the Up/Confirm/Down button(#6) briefly to move to the VOX response sensitivity selection mode.
- In the VOX response sensitivity selection mode, press the Up/Confirm/Down button (#6) briefly to enter to the Basic mode. The corresponding VOX response sensitivity will be displayed in the LCD panel (#11).
- Press the Up/Confirm/Down button (#6) to confirm your selection.

6) VOX recovery time selection mode

This allows the response characteristics of the VOX function to be precisely adjusted to suit individual needs.

To access the VOX Recovery Time Selection menu,

- When VOX Delay is highlighted, press the Page button (#6) until the Radio set up menu appears on the LCD panel (#11)
- Press the Up/Confirm/Down button(#6) to select from 5, 3, 2, or 1 second setting. This setting determines the delay time between transmitting and receiving.
- Press the Up/Confirm/Down button (#6) to confirm your selection.
- Please note you may need to try different VOX time settings to determine the best time to suit your speaking habit.

7) Call Ringer melody selection mode

- This feature provides 7 user selectable call ringer melodies to alert you of a calling party.

  To select your favorite Call Ringer melody,
- When Call is highlighted, press the Page button (#6) until the Radio set up menu appears on the LCD panel (#11).

  And then press the Up/Confirm/Down button (#6) to select your favorite Call Ringer melody.
- In the Call ringer melody selection mode, press the Up/Confirm/Down button (#6) briefly to choose the available to use.
- The corresponding Call ringer melody number will be displayed in the LCD panel (#11) and melody will be heard.
- Press the ENTER key (#2) to confirm your selection.

8) ROGER SELECTION MODE

If Roger option is on, when you finish the transmitting automatically the ALBRECHT GP 1 make a beep sound and transmit a sub-code tone to the partner.

To access the Roger Selection Mode :

- Press the Page button (#6) until the Radio set up menu appears on the LCD panel (#11). And then press the Up/Confirm/Down button (#6) Roger on or off.
- Function Button (#12) from the Key beep selection mode.

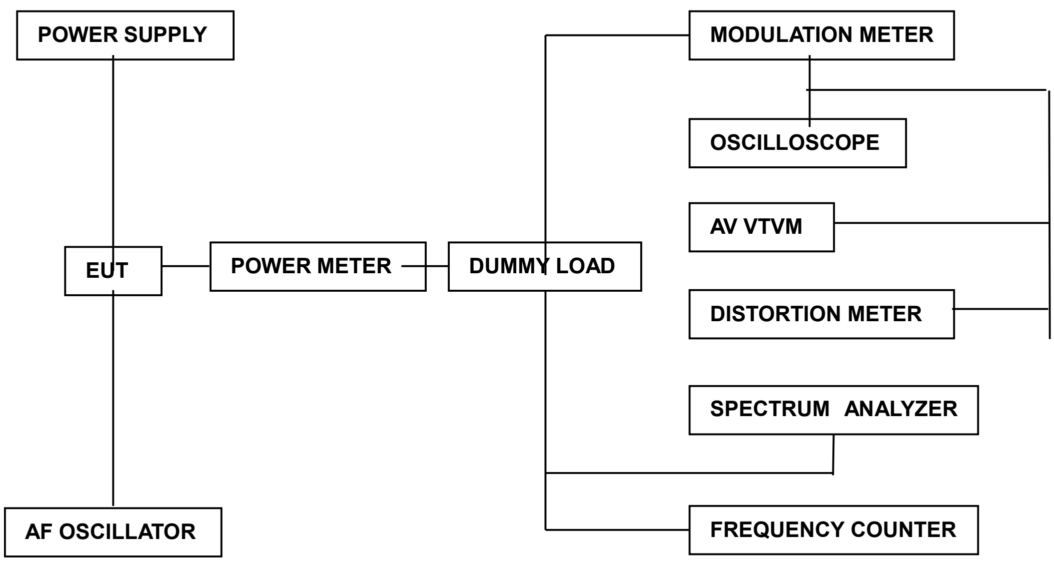
4. ADJUSTMENT

4.1 Frequency synthesizer (PLL)

a) After connecting the power meter and dummy load (50 Ohms), join the antenna connector of ALBRECHT GP 1 with above equipment.
b) Check the voltage between TP & GND in digital volt meter.
c) Then set the low channel of ALBRECHT GP 1 the lowest frequency.
d) After pressed PTT key of ALBRECHT GP 1, trim VC1 for adjusting the lowest frequency of Tx channel to DC 1.7V in the voltage of TP1.
e) After releasing the PTT key, And then check if the highest frequency of Rx channel is within DC 1.0V in the voltage of TP.

4.2 TRANSMITTER

a) Connect EUT & measure equipment according to block diagram below.



b) Connect DC 6.0V, voltage preset to EUT.
c) Connect "power meter" & "dummy load (50 Ohms)".
d) Adjust Tx frequency according to trimming trimmer VC2.

e) Connect AF oscillator to MIC terminal for conform modulation degree.
f) Adjust the frequency of AF oscillator to 1kHz and adjust AF level should be 60mV.
g) Checking oscilloscope and modulation meter. max. frequency deviation should be in +/-2.5KHz.

4.3 TRANSMITTER TEST

a) Output Power Test
Power(6.0V DC) should be Max. 500mW.

b) Audio Response
Connect AF oscillator to MIC terminal and then firm the audio level that doesn't distortion the wave of oscilloscope in the frequency range, 300Hz~3kHz. Check the audio level for 300Hz~3kHz based on frequency standard, 1kHz.

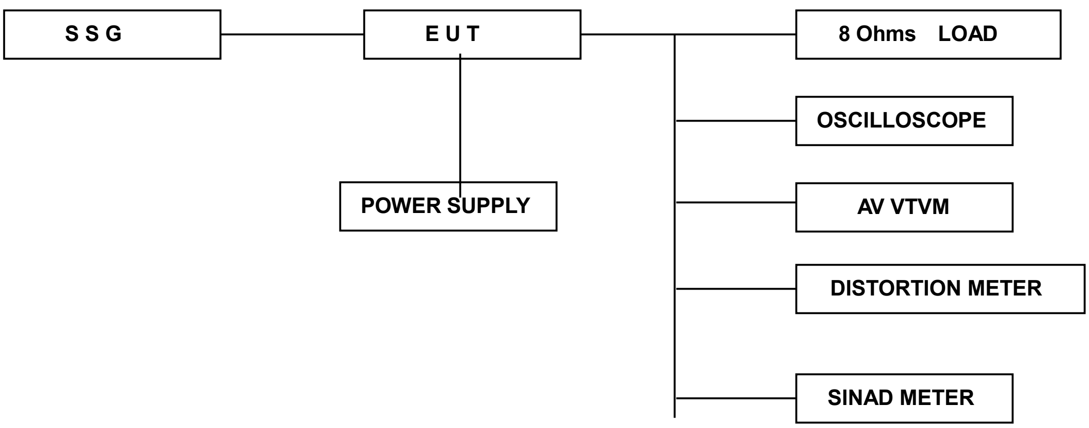
c) Modulation Degree Test
1) Connect AF oscillator to the MIC terminal and then adjust the level to 60mV
2) Measure the oscilloscope wave and he point needle of modulation meter after pressing PTT key.
3) Sweep gradually the frequency of AF oscilloscope from 300Hz to 3kHz.
4) At this time, the point needle of modulation meter should be in +/- 2.5KHz.

d) Spectrum Test
1) Antenna is 50 Ohms and attenuator degree should be 20dB more.
2) observe the spectrum with pressing PTT key.
The harmonics should be less -36/-30dBm than carrier.

4.4 RECEIVER

a) Preparation
1) Adjust the power supply to DC 6.0V
2) Adjust Voltage level to 0.7Vrms(8 Ohms load) after power on.

b) Connection method



C) The Conform of Rx sensitivity

1) Adjust SSG to channel frequency.
2) Adjust modulation frequency, 1kHz to modulation degree, 1.5KHz.
4) After adjusting the frequency of SSG to channel frequency, RF level sets to -47dBm.

d) The Conform of Squelch sensitivity

1) Set the standard channel.
2) In squelch mode, SQ volume RV1 must be turned counterclockwise.
3) After adjusting SSG to channel frequency, the adjusting SSG to level. –120dBm set is audio on, -130dBm set is audio off.

4.5 RECEIVER TEST

a) Rx sensitivity test

SSG should be adjusted to 12dB of SINAD's point needle seeing wave of oscilloscope as SSG sets in 1kHz with 1.5KHz frequency deviation. At this time, normal RF level is < -119Bm.

b) Audio Distortion Test

1) SSG should be adjusted like way of point a) and RF level sets to -47dBm.
2) Adjust to 0.7Vrms(8 Ohms load) seeing Audio wave.
3) Read the needle of distortion meter(normal condition would be less than 5% distortion.)

c) Squelch Test

After RF level of SSG should be set to the least level, RF level should be gradually increased until speaker makes audio sound.
At this point, check RF level
(Check Audio on : -120dBm, Audio off : -130dBm)

4.6 Symptoms, Check point & Correction

a) Diagnosis method

1) Check each switch to work well.
2) Check voltage of battery.
3) Problem develops from transmitter or receiver?

b) Troubleshooting

1) Transmitter

Power key is on condition but does not work.
Battery could completely discharge.
Battery cell twist.
Touch problem come between Battery and Radio.

Fail to transmit

Run out of battery or charge problem.
Fault of PTT key.
Fault of Q4, Q5, Q6.

Transmitter works but frequency is unmatched
Out of order in frequency synthesizer.
Out of order in X-tal(X2).

Audio does not sound(Tx power and Tx frequency are normal)
Problem of microphone or MIC connector.
IC U7 problem.

Tx is set when switch is on.
Tx switch problem

2) RECEIVER

Rx does not work
Speaker line open problem or connector problem.
Receiver power circuit problem.
Audio amplifier Base band IC U4 problem.

Only noise sound
U12 problem.
VCO problem.

Rx sensitivity is weak
Antenna mounting problem.
Front-End circuit problem.

Local oscillation frequency deviation.
SF1 saw filter fail.
VCO problem.

Squelch does not work
U12 problem.
Control logic problem.

5. DESCRIPTION OF RADIO CIRCUIT

5.1 Frequency synthesizer

Frequency synthesizer consists of VCO, PLL IC (built in PRESCALER) and loop filter.

a) VCO

VCO is composed of ONE VCO. Oscillation circuit takes colpitts circuit using variable Diode. And VCO is composed of D1, Q8, Q9,

C81, C75, VC1, L1, C74, C76.
VCO control voltage through loop filter adjusts frequency and Microphone signal through Modulation terminal makes modulation.

b) PLL IC

PLL IC is adjustable IC to produce the wished frequency which VCO provides through loop filter.
It has internal counter using 21.25MHz reference frequency to make 6.25kHz as reference Signal.
VCO frequency from prescaled input is divided signal is compared with Reference signal phase in phase comparator.
Built-in charger pump changes voltage (until two signals are in phase) and charged voltage supplies VCO through loop filter to produce the desired frequency.
Frequency data associated with channel goes to PLL IC by CPU through CLOCK, DATA.
PLL IC enables by strobe line of CPU.

c) Loop Filter

Loop filter is composed of R48, R49, C84, C85 and changes pulse from pin14 to DC. and eliminates harmonic component in pulse.
It helps VCO oscillate clearly as DC voltage is supplied into Varicap.

5.2 RECEIVER

This is composed of Dual Conversion Super Heterodyne. First IF is 21.7MHz. Local oscillator frequency is lower in 1'st IF than Rx frequency. It is called low side injection. Second IF is 450kHz.
2nd local oscillator frequency comes to 21.25MHz.

a) Rx/Tx Conversion Circuit

Rx signal goes to Rx/Tx conversion circuit through FIXED antenna connector, low pass filter(L5,L6,L7,C42,C43,C46,C47) and receiver resonance circuit composed of L8,C1 When transmitting, voltage through R25,L12,D6 supplies,D7 of receive input is short and Tx is on condition.
When PIN diode is off in condition of Rx, L8 and C1 resonate serially and make impedance matching at receiver band pass filter (SF1).

b) Front End

Front End has Q1 to provide a high sensitivity and low noise feature.
It employs Saw filter as band pass filter to eliminate image frequency and to produce enough pass band by Q1 input and output.

c) Mixer

Mixer has one base BFQ 67W(Q2) to feature high low noise quality.

It has RF signal through L7, L8, SF1, SF2 and Q1 RF signal from Local oscillator mixed.
It develops 1'st IF 21.7MHz. 1st IF goes to 1st IF amplifier Q3(2SC4083) base through X-tal filter XF1.
IF of mixing signals is selected and taken into X-tal filter.
Output impedance of mixer is direct matched with input impedance of X-tal filter.
Matching of filter satisfies pass bandwidth of filter, ripple elimination with in pass band, and attenuation characteristic of stop band.
X-tal filter is composed of two pole monolithic X-tal filter,
8kHz of IF bandwidth R11 is used as impedance matching with 1'st IF Amp Q3.

d) IF AMP and Detection

1'st IF AMP Q3 supplies IF(U12) mixer input pin16 through output resistor R13 and C21 to need gain in insertion loss of X-tal filter and last stage circuit. Multi-use IF IC makes up of mixer IF AMP. pin1 2'nd local frequency enter to pin 1.
It supplies mixer of internal IC. Mixer output of IC through pin3 passes 450kHz ceramic filter, supplies 2'nd IF amplifier and limits. After 2'nd IF AMP has a process of enough gain and AM rejection, it comes to quadrature detection. Demodulated audio signal by T1 (Quad Coil) is amplified and comes out to pin9.
Detected audio signal through R22, VR1 and input in audio amp. IC U4 through C22.

e) Squelch Circuit

Noise component of detected outputs has amplification
Squelch threshold is controlled by Resistor R18,C31,R15

f) Audio Amplifier

Demodulated audio signal enters to pin2 of U4. After above signal amplies in U4 pin5 through C220.
It comes out to pin5 Then, It reaches at speaker.

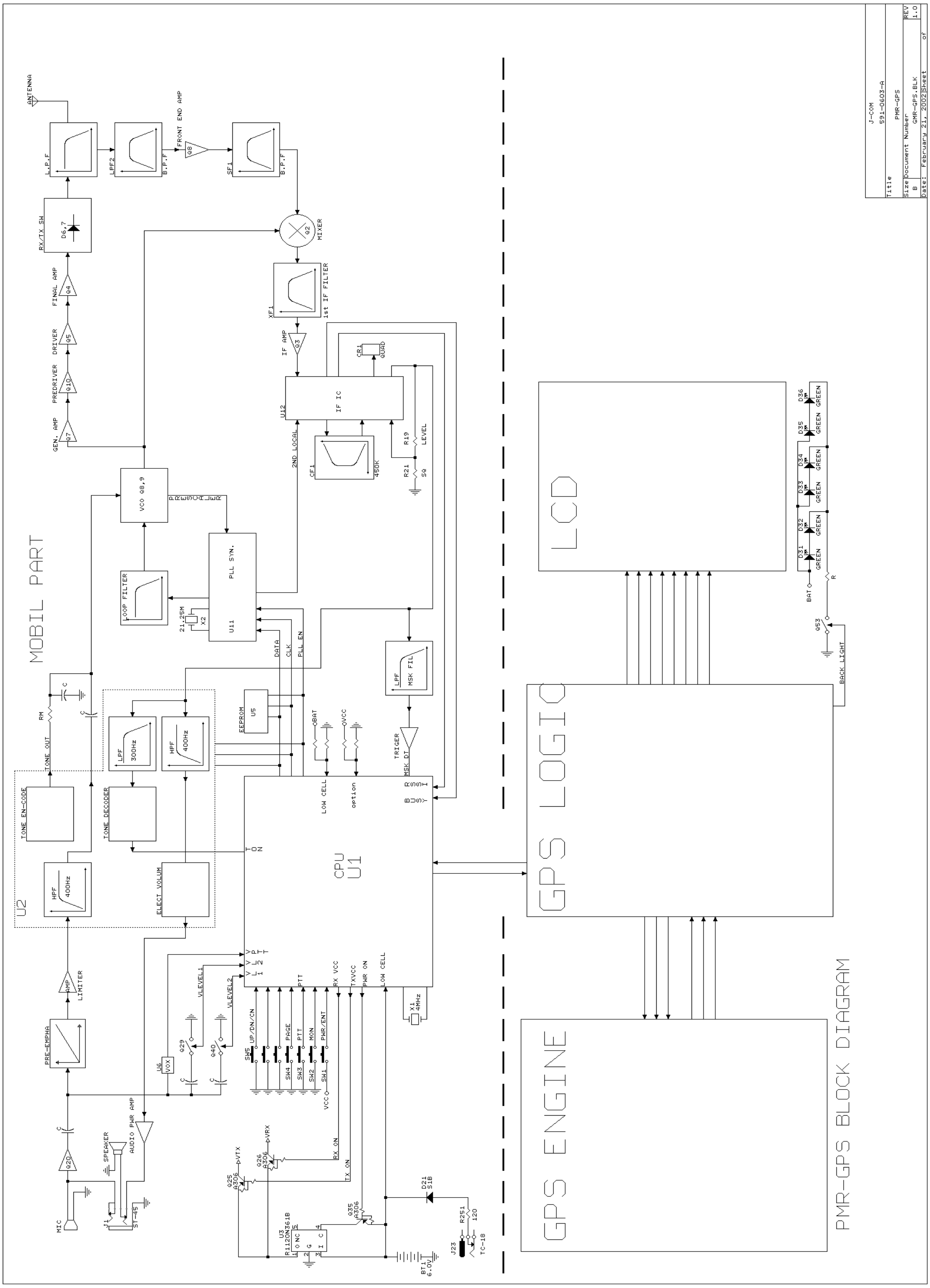
5.3 Transmitter

When Tx develops with pressing PTT switch, VCO output amplifies through Q4,Q5 transmits by antenna through low pass filter.
Tx RF signal produced from Tx VCO is amplified by DRIVER Q5 through C53 and entered Q4 POWER TR input terminal with final amplification. After this stage, the signal is emitted at antenna through 50 Ohms Output matching circuit to low pass filter(L7, L6, L5, C42, C43, C44, C46, C47) to eliminate harmonic.

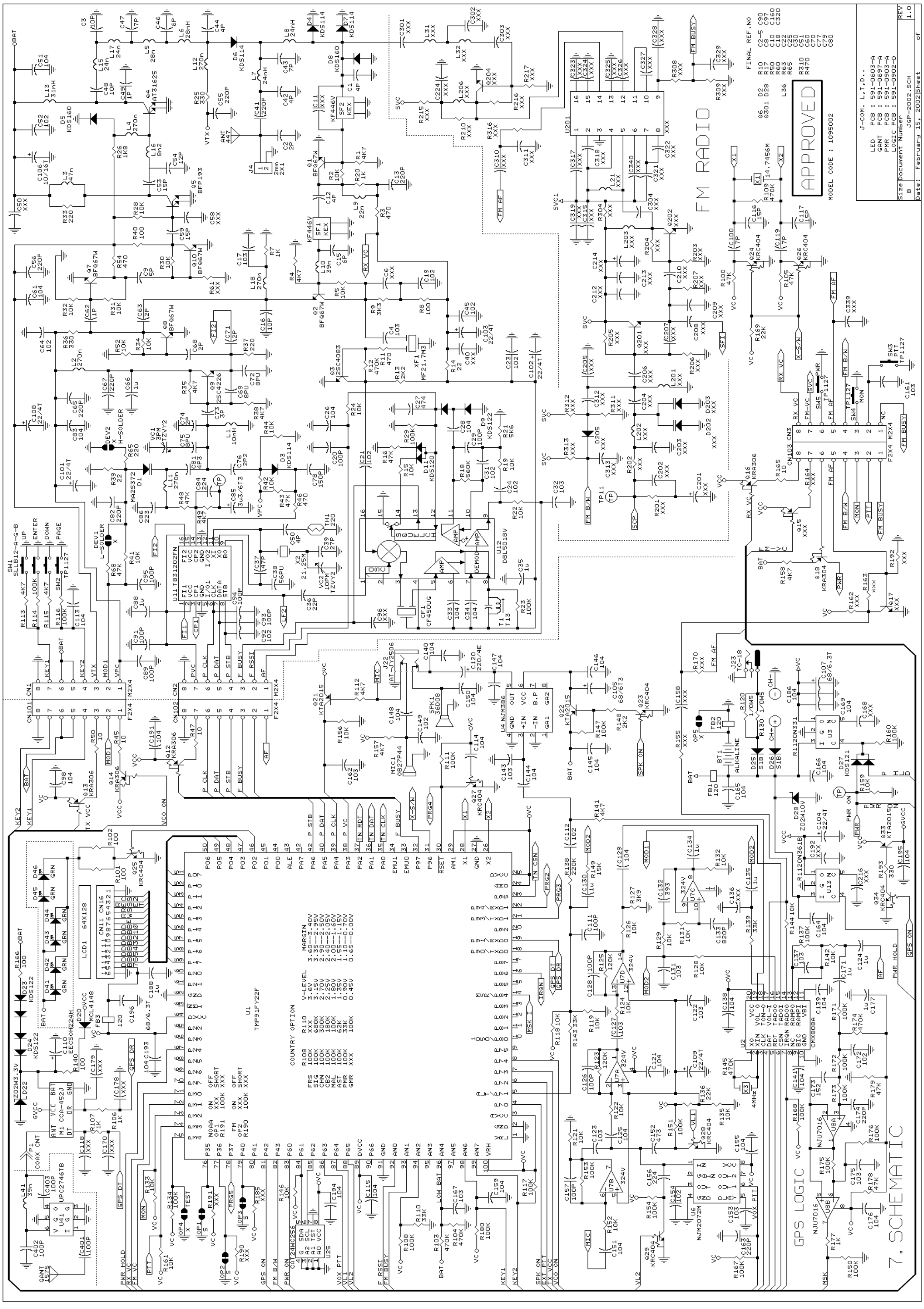
5.3-1 Audio Modulation and Audio Amplification

Audio signal produced by external or internal microphone, limits amplification by IC U7.. It enters to VCO through low pass filter and U2.
Max. Frequency modulation deviation is adjusted by VR1 keeps noise and audio from entering to VCO at time of Tx.
Audio modulation and Audio Amplification has characteristic of 6dB/OCT pre-emphasis by U7(NJM324V).

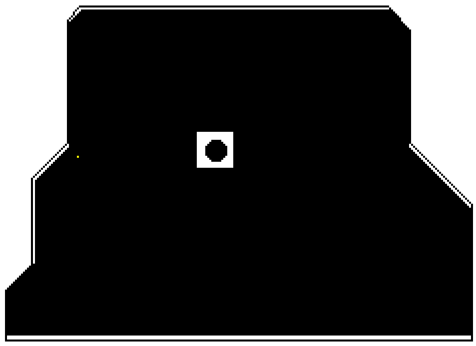
3. BLOCK DIAGRAM



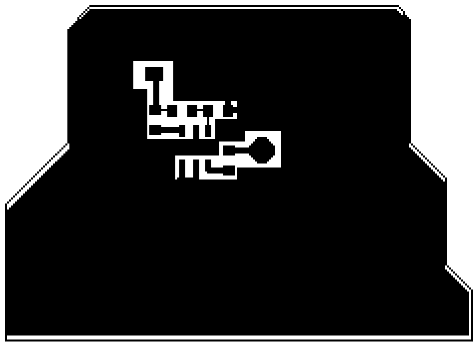
4. SCHEMATIC

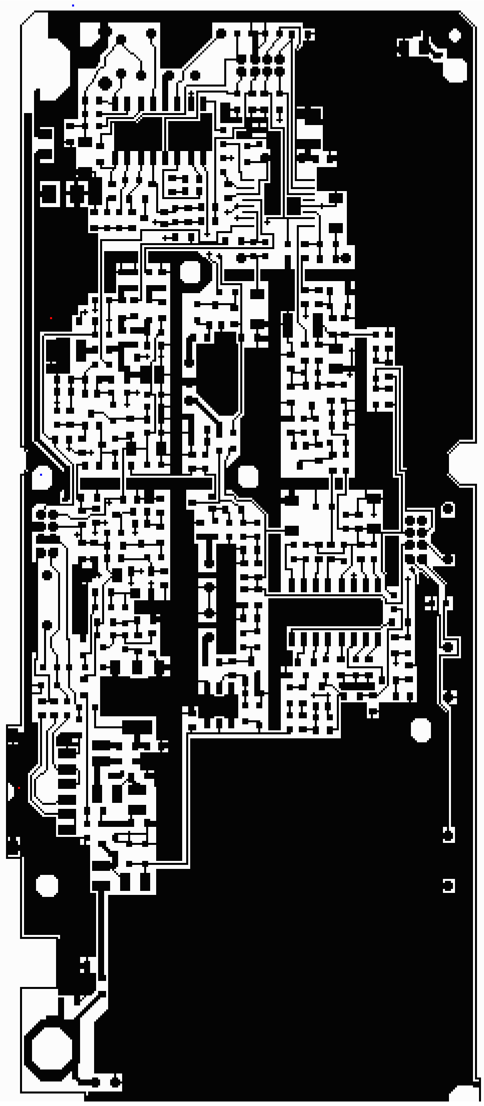


SOLDER SIDE PATTERN(GAS6 PCB)

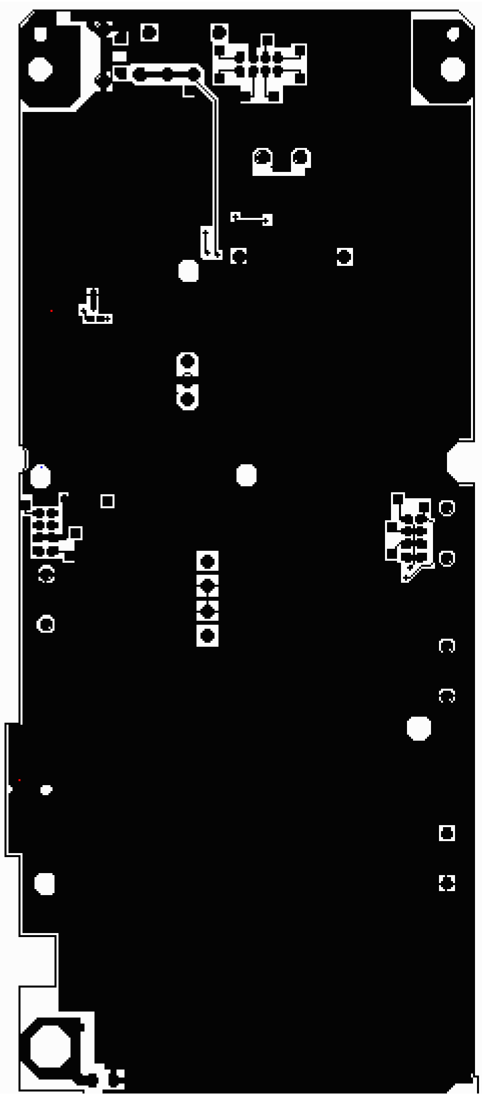


COMPONENT SIDE PATTERN (GAS6 PCB)

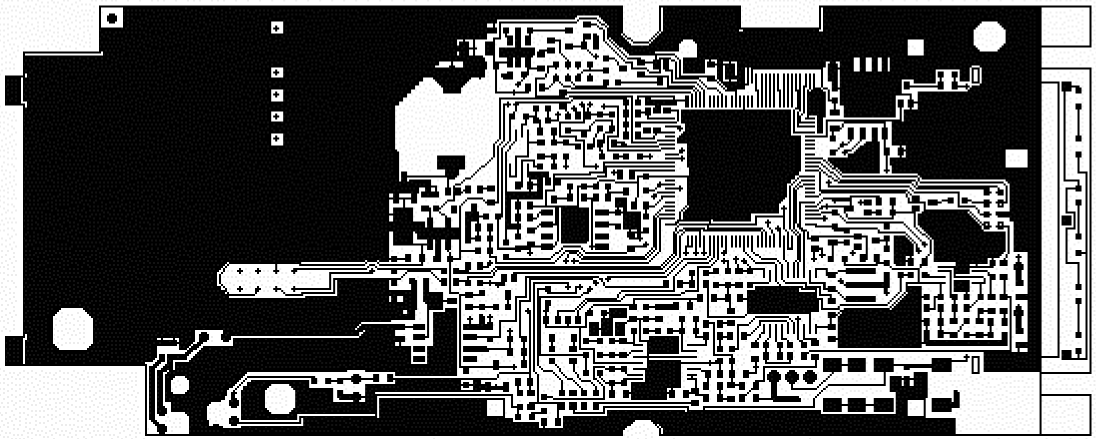




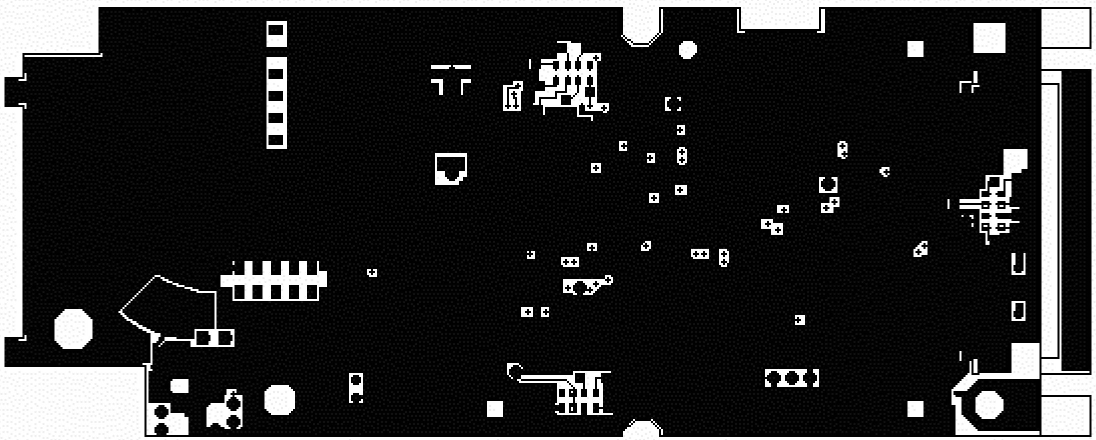
OMPONENT SIDE PATTERN(JFRO PCB)



OLDER SIDE PATTERN(JFRO PCB)



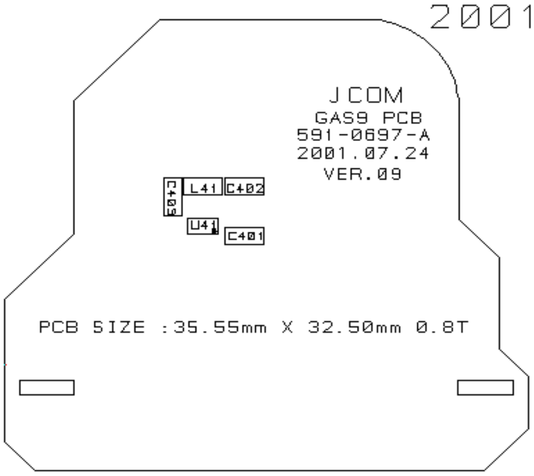
COMPONENT SIDE PATTERN(JNL11 PCB)



SOLDER SIDE PATTERN(JNL11 PCB)

GAS TOP REF. MAP

2001.09.28

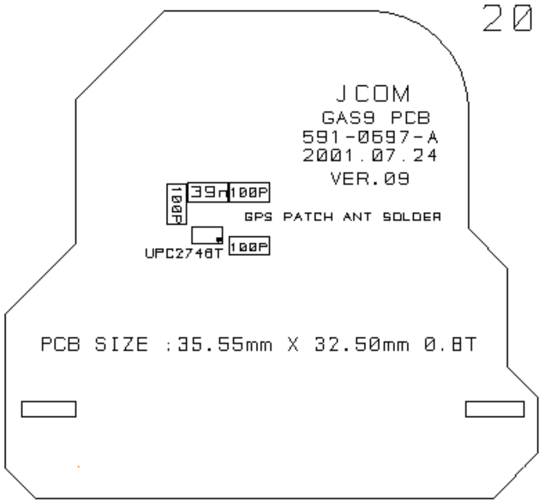


MODEL CODE	1-09-XX-XX
PCB PART No.	591-0697-A
VENDER CODE	GAS9.CDO
SCHEMATIC VER.	
REMARK	

APPROVED

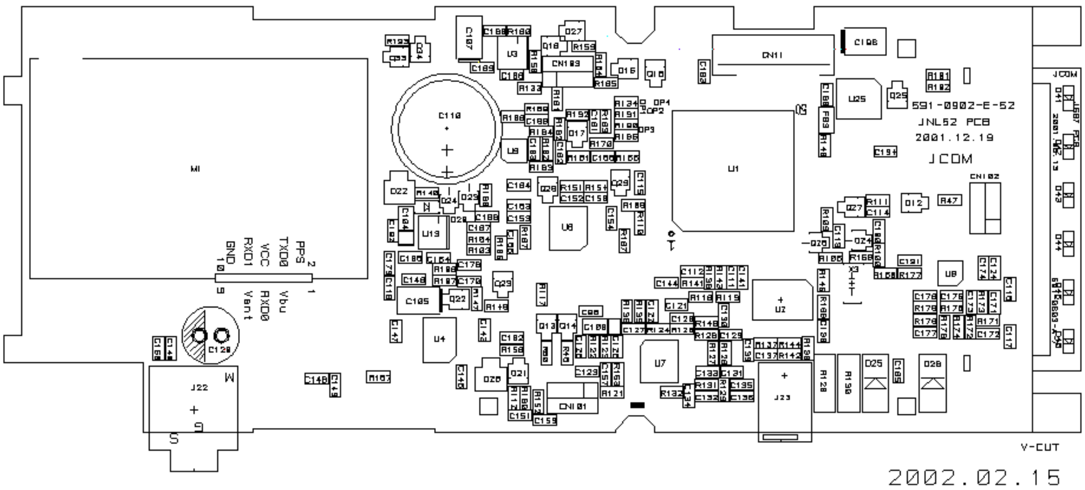
GPS ANT TOP VALUE MAP

2001.09.28



MODEL CODE	1-09-XX-XX
PCB PART No.	591-0697-A
VENDER CODE	GAS9.CDO
SCHEMATIC VER.	JGP-2002F.SCH (0.1)
REMARK	

APPROVED



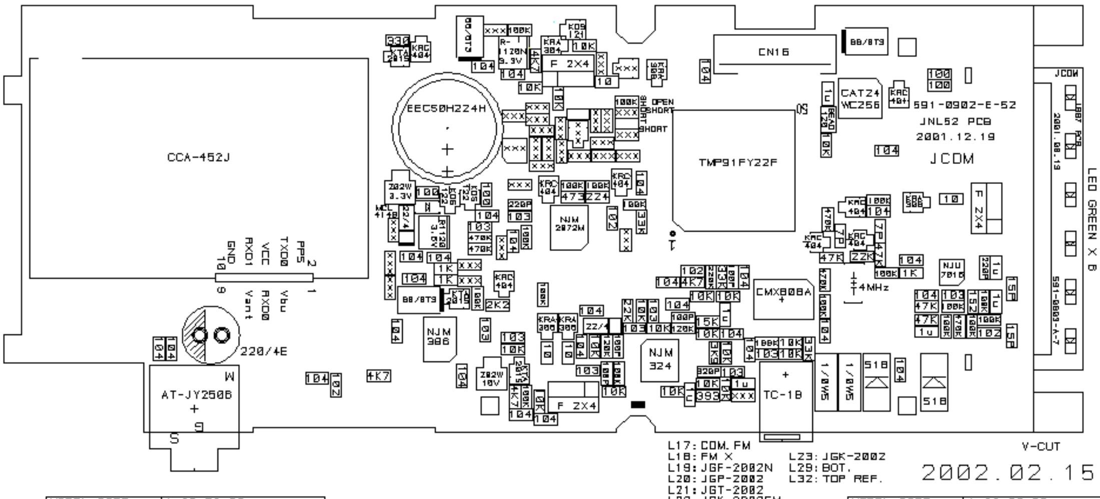
2002.02.15

JNL PCB TOP REFERENCE MAP

MODEL CODE	1-09-XX-XX
PCB PART No.	591-0902-E
VENDER CODE	JNL52.CDO
SCHEMATIC VER.	
REMARK	

MODEL CODE	1-09-XX-XX
PCB PART No.	591-0603-A
VENDER CODE	JG87.CDO
SCHEMATIC VER.	
REMARK	

APPROVED



L17: COM. FM
L18: FM X
L19: JGF-2002N
L20: JGP-2002
L21: JGT-2002
L22: JGK-2002FM
L23: JGK-2002
L29: BOT.
L32: TOP REF.

2002.02.15

MODEL CODE	1-09-50-02
PCB PART No.	591-0902-E
VENDER CODE	JNL52.COO
SCHEMATIC VER.	JGP-2002.SCH (1.1)
REMARK	

JGP-2002 LOGIC TOP VALUE MAP

MODEL CODE	1-09-50-02
PCB PART No.	591-0603-A
VENDER CODE	JG87.COO
SCHEMATIC VER.	JGP-2002.SCH (1.1)
REMARK	

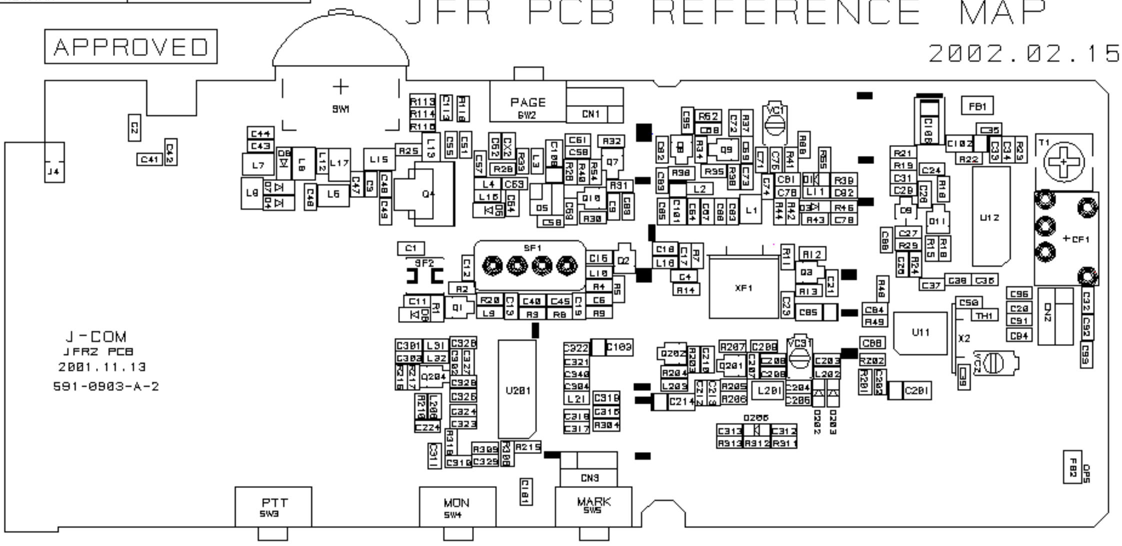
APPROVED

MODEL CODE	1-09-XX-XX
PCB PART No.	591-0903-A
VENDER CODE	JFR2.COO
SCHEMATIC VER.	
REMARK	

JFR PCB REFERENCE MAP

APPROVED

2002.02.15



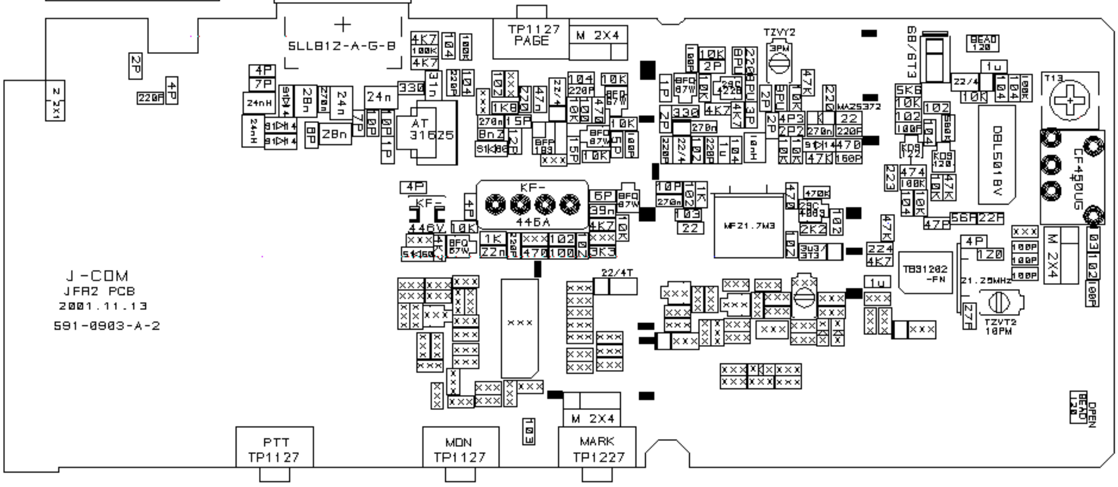
MODEL CODE	1-09-50-02
PCB PART No.	591-0903-A
VENDER CODE	JFR2.CDO
SCHEMATIC VER.	JGP-2002.SCH (1.1)
REMARK	

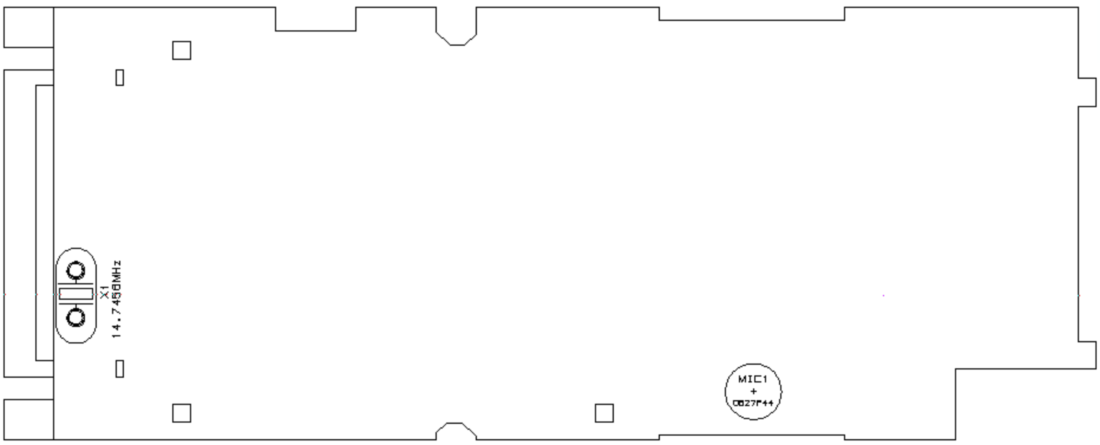
JGP-2002 RF PCB
TOP VALUE MAP

L17: COM.
L18: FM X
L19: FM.
L20: JGP-2002FM
L21: JGT-2002
L22: JGK-2002FM

APPROVED

2002.02.15



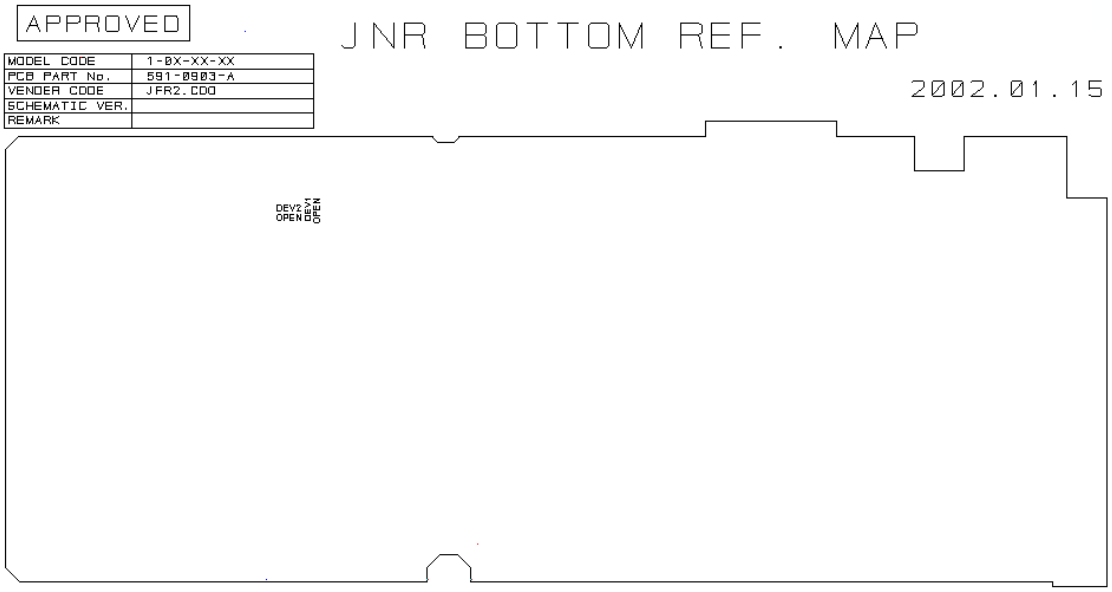


APPROVED

JNL PCB BOTTOM
REF/VALUE MAP

2002.02.15

MODEL CODE	1-0X-XX-XX
PCB PART No.	591-0902-E
VENDER CODE	JNL52.CDO
SCHEMATIC VER.	
REMARK	



5. COMPONENT PARTLIST

Revised: February 15, 2002
JGP-2002.SCH Revision: 1.0
Bill Of Materials February 21, 2002 17:35:49 Page 1

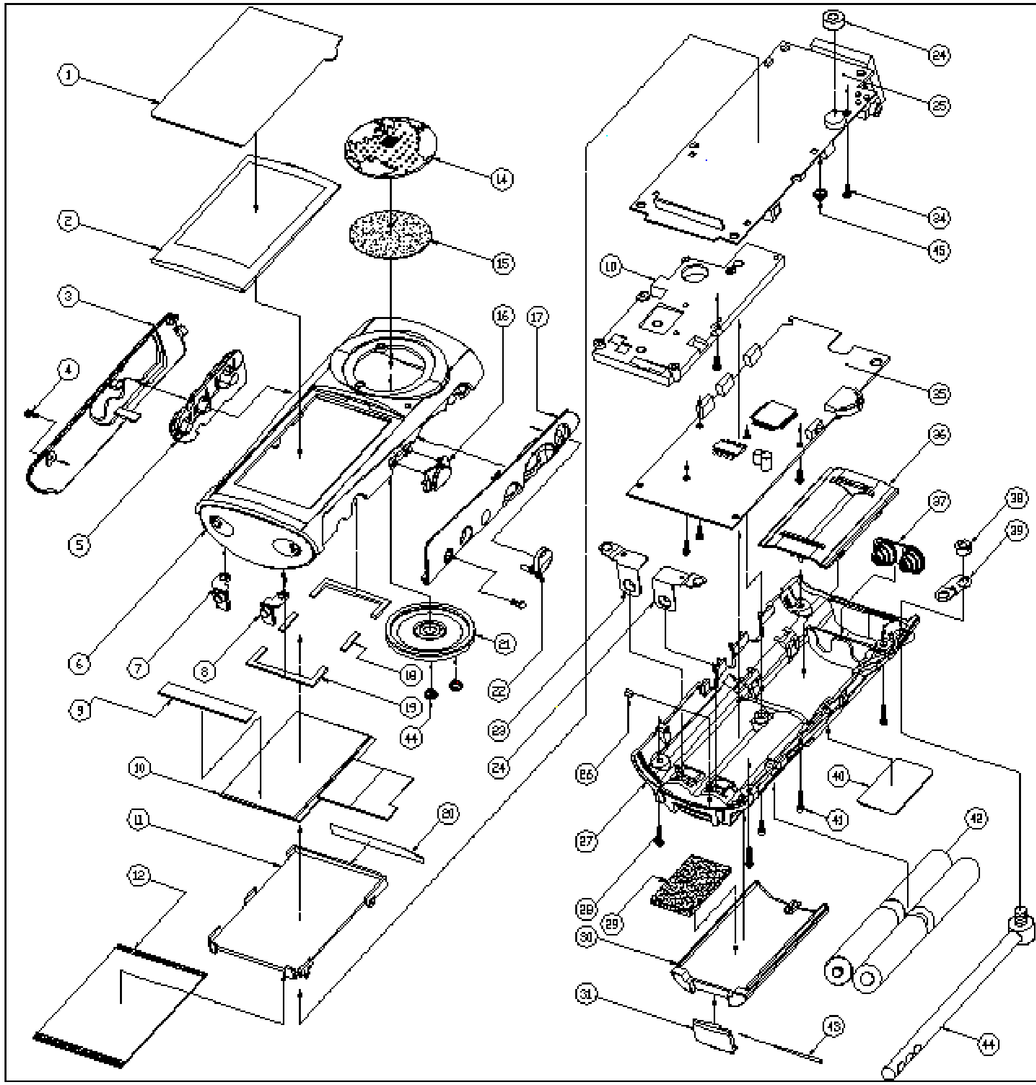
Item	Quantity	Reference	Part
1	1	ANT	447
5	5	C2,C63,C68,C71,C74	2P
6	5	C1,C12,C42,C44,C50	4P
7	3	C3,C16,C48	10P
8	14	C4,C17,C32,C122,C123, C127,C131,C137,C143,C153, C161,C162,C167,C175	103
9	1	C9	5P
10	9	C13,C41,C55,C56,C65,C67, C82,C163,C174	220P
11	2	C15,C46	6P
12	13	C19,C21,C23,C24,C31,C45, C52,C64,C92,C112,C149, C154,C172	102
13	14	C20,C29,C89,C91,C93,C94, C95,C111,C126,C128,C157, C401,C402,C403	100P

14	37	C26,C28,C33,C34,C51,C61, C83,C98,C113,C114,C115, C121,C125,C129,C138,C139, C140,C141,C144,C145,C146, C147,C148,C150,C151,C155, C159,C164,C165,C166,C169, C176,C186,C191,C193,C194, C195	104
15	1	C27	474
16	10	C35,C66,C88,C124,C130, C134,C135,C171,C177,C188	1u
17	1	C36	22P
18	1	C37	47P
19	1	C38	56PU
20	1	C39	27P
21	4	C43,C47,C100,C119	7P
22	2	C49,C62	1P
23	4	C53,C59,C116,C117	15P
24	1	C54	12P
25	3	C69,C72,C75	8PU
26	1	C73	3P
27	1	C76	2P2
28	1	C78	150P
29	1	C81	4P3
30	2	C84,C156	224
31	1	C85	3u3/6T3
32	1	C86	223
33	6	C101,C102,C103,C104,C108, C109	22/4T
34	1	C105	68/6T3
35	1	C106	10/16T
36	2	C107,C196	68/6.3T
37	1	C110	EECSOH224H
38	1	C120	220/4E
39	1	C132	393
40	1	C133	820P
41	1	C152	473
42	1	C173	152
43	1	CF1	CF450UG
44	1	CH-	-
45	3	CN1,CN2,CN3	M2X4
46	3	CN101,CN102,CN103	F2X4
47	1	CN11	CN16
48	1	D1	MA2S372
49	4	D3,D4,D6,D7	KDS114
50	2	D5,D8	KDS160
51	3	D9,D23,D24	KDS122
52	1	D11	KDS120
53	1	D20	MCL4148
54	1	D22	Z02W3.3V
55	2	D25,D26	S1B
56	1	D27	KDS121
57	1	D28	Z02W10V
58	6	D41,D42,D43,D44,D45,D46	GRN
59	1	DEV1	L-SOLDER,X
60	1	DEV2	H-SOLDER,X
61	1	E7	XX3P

62	3	FB1,FB2,FB3	120
63	1	GANT	1575
64	1	J4	2X1,2mm
65	1	J22	AT-JY2506
66	1	J23	TC-18
67	2	L7,L8	24nH
68	1	L9	22n
69	2	L10,L41	39n
70	5	L2,L4,L11,L12,L18	270n
71	1	L1	10nH
72	1	L3	47n
73	1	L5	28n
74	1	L6	28nH
75	1	L13	31nH
76	2	L15,L17	24n
77	1	L16	8n2
78	1	LCD1	64X128
79	1	M1	ALBRECHT GP 1
80	1	MIC1	OB27P44
81	3	OP1,OP2,OP3	S
82	1	OP4	X,TEST
83	1	OP5	X
84	1	P1	COAX CNT
85	5	Q1,Q2,Q7,Q8,Q10	BFQ67W
86	1	Q9	2SC4226
87	4	Q12,Q13,Q14,Q16	KRA306
88	1	Q3	2SC4083
89	1	Q4	AT31625
90	1	Q5	BFP193
91	8	Q23,Q24,Q25,Q26,Q27,Q28, Q29,Q34	KRC404
92	1	Q18	KRA304
93	3	Q21,Q22,Q33	KTA2015
94	34	R2,R5,R15,R19,R22,R24, R28,R30,R31,R32,R34,R41, R42,R44,R52,R118,R119, R121,R122,R124,R126,R128, R129,R131,R132,R133,R135, R142,R144,R146,R152,R156, R159,R161	10K
95	5	R7,R20,R106,R107,R177	1K
96	6	R8,R40,R101,R102,R140, R166	100
97	1	R9	3K3
98	2	R13,R148	2K2
99	11	R1,R4,R35,R38,R49,R112, R113,R115,R141,R157,R158	4K7
100	4	R3,R11,R46,R54	470
101	1	R18	560K
102	1	R21	5K6
103	23	R23,R29,R108,R111,R114, R116,R117,R134,R137,R147, R150,R151,R153,R154,R160, R167,R168,R171,R172,R173, R175,R176,R180	100K
104	3	R25,R36,R193	330
105	1	R26	1K8

106	4	TH1,R33,R37,R65	220
107	2	R14,R39	22
108	8	R16,R43,R48,R68,R100, R105,R178,R179	47K
109	4	R45,R47,R50,R165	10
110	6	R12,R103,R104,R109,R145, R174	470K
111	3	R110,R139,R143	33K
112	2	R120,R130	1/0W5
113	2	R123,R125	120K
114	1	R127	3K9
115	2	R136,R169	22K
116	1	R138	220K
117	1	R149	15K
118	1	R163	xxx
119	2	SF1,SF2	KF446V,KEX
120	1	SPK1	36D08
121	1	SW1	SLLB12-A-G-B,UP
122	1	SW2	TP1127,PAGE
123	1	SW3	TP1127,PTT
124	1	SW4	TP1127,MON
125	1	SW5	TP1127,PWR
126	1	T1	T13
127	1	TP10	TP,PWR ON
128	2	TP1,TP11	TP
129	1	U2	CMX808A
130	1	U3	R1120N331
131	1	U4	NJM386
132	1	U6	NJM2072M
133	1	U7	324V
134	1	U8	NJU7016
135	1	U11	TB31202FN
136	1	U12	DBL5018V
137	1	U13	R1120N361B
138	1	U1	TMP91FY22F
139	1	U25	CAT24WC256
140	1	U41	UPC2746TB
141	1	VC1	3PM,TZVY2
142	1	VC2	10PM,TZVY2
143	1	X1	14.7456M
144	1	X2	21.25M
145	1	X3	4MHz
146	1	XF1	MF21.7M3

6. ASSEMBLY DRAWING



NO.	PART NO.	PART NAME	DESCRIPTION	Q'TY	REMARKS
45		SPEAKER SPRING	PBV(Ø0.3), Au-plating	1	
44	709-0020-A	CONTACT S/P SPRING	PBV(Ø0.3), Au-plating	2	
44	709-0018-A	PIN	SUS304 VPB, NI-PLATING	1	
43		FRS ANTENNA	URETHANE	1	
42		BATTERY	"AA" TYPE	4	
41	706-0022-A	SCREW TAPPING	BH, M2.6*10 [illegible]	1	
40	705-0219-A	LABEL SPEC.	POLYESTER FILM	1	
39	702-0049-A	CONTACT ANT.	PBS, t0.3, Au-plating	1	
38	709-0008-A	ANT. NUT	NiSel. Ø6*3.5, Ni-plating	1	
37	709-0017-A	CONTACT SPRING	PW(Ø0.6), AU-PLATING	1	
36	711-0213-A	BATTERY GUIDE	PLOYCABONETE	1	
35		FRS PCB		1	
34	706-0020-A	SCREW TAPPING	BH, M2.0*6 [illegible]	5	
33		ENGINE PCB A'SSY		1	
32	703-0020-A	BUSHING MIC.	SILICON	1	
31	711-0214-A	LOCKER	PLOYCABONETE	1	
30	711-0212-A	BATTERY COVER	PLOYCABONETE	1	
29	704-0045-A	SPONGE BATTERY	URETHANE SPONGE, 40*24*t3.0	1	
28	706-0021-A	SCREW MACHINE	BH, M2.0*5 [illegible]	3	
27	710-0211-A	BACK COVER	PLOYCABONETE	1	
26	704-0044-A	SPONGE LOCKER	RUBBER SPONGE, 15*2.5*t1.0	1	
25	706-0023-A	SCREW TAPPING	BH, M2.0*8 [illegible]	2	
24	702-0039-A	CONTACT B/T-R	PBS, t0.3, Au-PLATING	1	
23	702-0040-A	CONTACT B/T-L	PBS, t0.3, Au-PLATING	1	
22	711-0219-A	CAP EARPHONE	PVC	1	
21		SPEAKER		1	
20	704-0041-A	REFLECTOR SHEEL-A	P.E [illegible], 40*62.5*t0.03	1	
19	704-0036-A	CUSHION LCD-A	P.U FORM, 40.5*9.5*t0.8	2	
18	704-0037-A	CUSHION LCD-B	P.U FORM, 9.5*2.0*t0.8	2	
17	711-0215-A	SIDE COVER-R	POLYCABONETE(N/Silver Spray)	1	
16	703-0022-A	PAGE KNOB	SILICON	1	
15	704-0040-A	FELT SPEAKER	HONELON, D27*t0.2	1	
14	711-0217-A	GRILL	POLYCABONETE	1	
13	711-0218-A	SHIELD CASE	ABS, NI-PLATING	1	
12	704-0042-A	REFLECTOR SHEEL-B	P.E(WHITE), 40*62.5*t0.05	1	
11	711-0221-A	REFLECTOR LCD	POLYCABONETE([illegible])	1	
10		LCD		1	
9	704-0043-A	REFLECTOR SHEEL-C	P.E(BLACK), 37.5*4.5*t0.1	1	
8	702-0042-A	TERMINAL-R	PBS, t0.3, Au-PLATING	1	
7	702-0041-A	TERMINAL-L	PBS, t0.3, Au-PLATING	1	
6	710-0210-A	FRONT COVER	PLOYCABONETE(SANDING)	1	
5	703-0021-A	PTT KNOB	SILICON	1	
4	706-0019-A	SCREW TAPPING	OH, M1.7*6 NI-PLATING	2	
3	711-0216-A	SIDE COVER-L	POLYCABONETE(N/Silver Spray)	1	
2	701-0220-A	WINDOW LCD	PMMA	1	
1	704-0046-A	PROTECT WINDOW	3M #4197C t0.15(Polyethylene)	1	

Material

Decimals Tolerance

Decimals Tolerance

Date 2000.9.1	Q'ty		
Scale N/S	Unit mm		
Drawing	Checked	Approved	
S.D. LEE	2000.5.30 REV.00		

TITLE **EXPLODED VIEW**

Item No. **HP-2002F**

Part No.

Dwn No.

J COM

7. CHANNEL DATA

CH	TX FREQ		CH	1'st Local
1	**446.00625**		**1**	**424.30625**
2	**446.01875**		**2**	**424.31875**
3	**446.03125**		**3**	**424.33125**
4	**446.04375**		**4**	**424.34375**
5	**446.05625**		**5**	**424.35625**
6	**446.06875**		**6**	**424.36875**
7	**446.08125**		**7**	**424.38125**
8	**446.09375**		**8**	**424.39375**